

Workload: Measurement and Management

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How can measures or tools be developed to unobtrusively measure workload?

Result FY 09: Workload Primer (Casner & Gore, 2009)

Literature Review Selection Criteria

- Principled tool development approach,
- Peer-reviewed articles (NASA, DTIC, HFES, ISAP, IJAP, IEEE),
- Applicable to a range of conditions relevant for space operations
- Field-Ready Tools for Measuring and Evaluating Workload

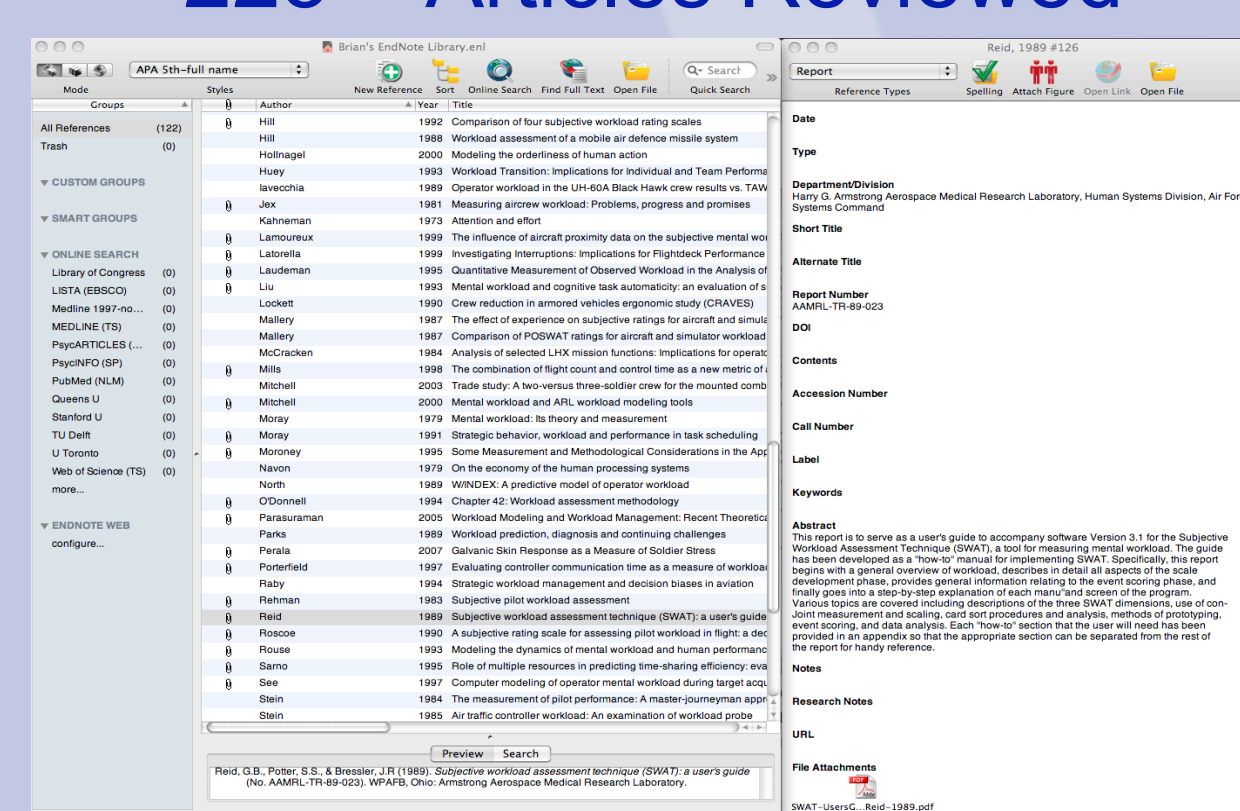
Compile Toolset of “Best” Tools including...

- NASA TLX
- Bedford
- Cooper-Harper / Modified Cooper-Harper
- Subjective Workload Assessment Technique (SWAT)
- Instantaneous Self Assessment (ISA)
- Physiological measures

Measuring and Evaluating Workload: A Primer (Casner & Gore, 2009)

Annotated Bibliography

225 + Articles Reviewed



Tool Selection

- Research points towards no one, single approach to determine the suitability of workload in various operational contexts
- Different workload evaluations will be needed at different phases of the development cycle
- Workload Primer assists in deciding how and when to use the various tools

Compare / Contrast / Evaluate Tools

- Uni-dimensional and multi-dimensional scales
- Subjective and objective scales
- Thresholds for requirements-related (absolute thresholds) versus design-related (relative) comparisons
- Task suitability / relevance
- Included: NASA TLX, Bedford, Cooper-Harper, Modified Cooper-Harper, SWAT, ISA, DRAWS, TLAP, POSWAT, SWORD, and many others

Future Directions

Research gaps emerged:

- Regularly scheduled repetitive, workload intensive operations
- Dose concept to workload experience is proposed

Augment the FY09 Primer to include workload measurement from the system perspective for space operations:

Aim A. Mission Specialists' Operational Environment and Workload Considerations

Crew member debrief databases will be used to gain insights into events that cause workload levels that exceed or fail to meet the crew member's acceptable workload level

Aim B. Determine the common variables impacting workload when measured at the individual level and workload from the system level

Identify individual and system workload parameters needed to attain specific system goals and how operators effectively manage workload to attain system goals for long duration operations

Aim C. Scales, Measurement, & Management Workshop

Gain the most current scales- and management-related information by organizing, hosting and leading a scales and management workshop with the goal of answering how workload has been managed across the system

Aim D. Refine FY 09 Primer with protocol development and workload scale considerations

Refine the considerations that need to be heeded when selecting a workload measurement tool (e.g. NASA TLX, Bedford Scales)

Aim E. Develop a meaningful measure of system workload

A system workload algorithm will be created once the system workload parameters are identified from Aims B and C

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